

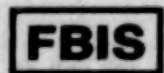
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14 February 1980

USSR Report

CYBERNETICS, COMPUTERS AND
AUTOMATION TECHNOLOGY

No. 49



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CYBERNETICS, COMPUTERS AND
AUTOMATION TECHNOLOGY

No. 49

This serial publication contains articles, abstracts of articles and news items from USSR scientific and technical journals on the specific subjects reflected in the table of contents.

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I. DEVELOPMENT AND PRODUCTION OF COMPUTERS AND CONTROL EQUIPMENT

A. General Treatment

SAVINGS ATTRIBUTABLE TO CYBERNETICS INSTITUTE

Kiev PRAVDA UKRAINY in Russian 11 Oct 79 p 2

[Article by A. Lysenko: Report on Cybernetics]

[Excerpt] In the Cybernetics Institute of the Academy of Sciences of the Ukrainian SSR under the chairmanship of Lenin prize winner Yu. A. Mitropol'skiy there took place a general meeting of the Department of Mathematics, Mechanics and Cybernetics. The director of the Institute, Hero of Socialist Labor and Lenin prize winner V. M. Glushkov gave a clear report on the activity of the Institute. The members have solved important problems in computer technology, automated systems and their effective use in increasing the rate of scientific/technical progress.

Each year in the institute, 290 designated work units are completed, 303 developments are introduced, these are incorporated in 45 ministries and departments. The savings attributable to these projects exceeded 143 million rubles.

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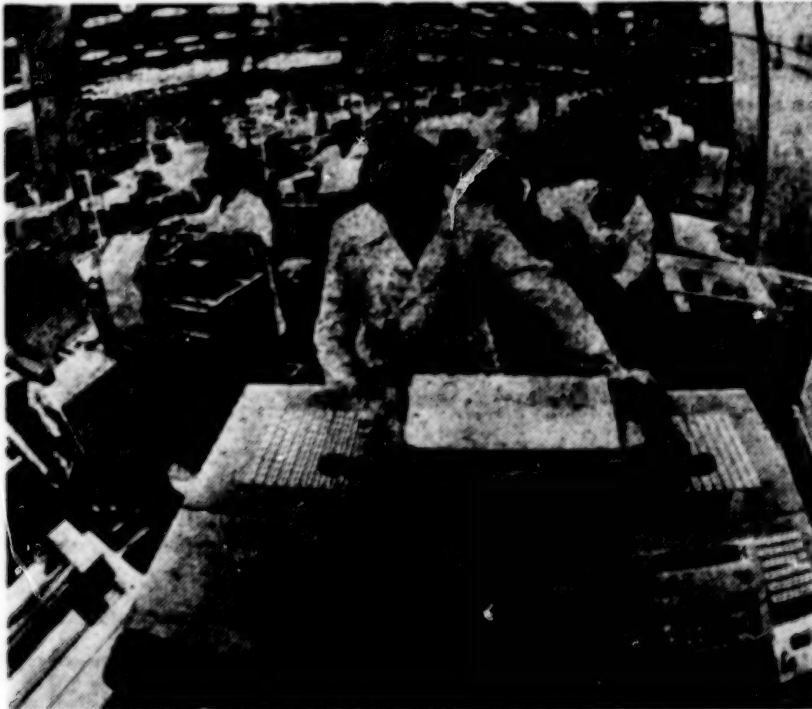
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B. Production Plants

ISKRA-554 PRODUCTION BEGUN

Moscow PRAVDA in Russian 14 Nov 79 p 2

[Text] The Smolensk Production Association Produces equipment used to automate bookkeeping work. Production of a new computer for bookkeeping, the Iskra-554, is now being mastered.



The Iskra-554

[140]

CSO: 1863-P

COMBINED CONTROL SYSTEM INTRODUCED

Yerevan PROMYSHLENNOST' ARMENII in Russian No 10, 1979 pp 15-16

[Article by K. A. Ambartsumyan, deputy minister of local industry of the Armenian SSR]

[Excerpts] In our country two connections of science with production have long been practiced: the successive (scientific research--experimental designing--production) and the parallel (simultaneous scientific research, experimental designing and production).

The first type of connection permits reducing expenditures but increases the time required for the transformation of "an idea into metal," since the correction of errors and shortcomings, alterations and modernization and the taking of distinctive features of production into consideration are accomplished in the intermediate stage (during experimental designing), which embraces a large interval of time.

In the second case the time periods are curtailed but expenditures are increased, since together with the rapid output of an article a "flaw in the idea of the designer" is transformed at once into a "flaw in the article."

A combined arrangement that takes into consideration positive aspects of both alternatives is optimal.

By applying a parallel-successive plan the Yerevan Scientific Research Institute of Mathematical Machines has in a short time accomplished the development of the "Nairi-4," YeS-1030 and YeS-1045 computer families, universal storage units and other devices, units and articles that have been successfully introduced into series production at various plants.

[141-2174]

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USSR

UDC 681.3.068

ON FACILITIES FOR DEVELOPING SOFTWARE FOR MICROPROCESSOR SYSTEMS

Kiev KIBERNETIKA in Russian No 4, Jul/Aug 79 pp 41-46 manuscript received 4 May 78

KORNIYENKO, GRIGORIY IVANOVICH, candidate in technical sciences, Assistant to the Director, Special Design Bureau, Mathematical Machines and Systems, Institute of Cybernetics, UkrSSR Academy of Sciences; BARSUK, YAKOV IZRAILEVICH, candidate in technical sciences, Chief Designer of a project, Special Design Bureau, Mathematical Machines and Systems, Institute of Cybernetics, UkrSSR Academy of Sciences, Kiev; PIKH, ZENOVIIY ANDREYFVICH, head of a division, Computing Center, Institute of Applied Problems of Mathematics and Mechanics, L'vov; KOLESNIKOV, ANDREY NIKOLAYEVICH, engineer, Computing Center, Institute of Applied Problems of Mathematics and Mechanics, L'vov; and REYZIN, ALEKSANDR LEONIDOVICH, engineer, Computing Center, Institute of Applied Problems of Mathematics and Mechanics, L'vov

[Abstract] Recent development in hardware such as microprocessors, integrated memories and miniaturized high-speed peripheral devices as well as standardization of communication channels and interfaces have shifted the emphasis in development of computing systems from design of modules to development of architecture and software of the computer complexes. As a result, the cost of a computing system based on microprocessors is now determined chiefly by the cost of the software. This is because the reduction in the cost of hardware is accompanied by increased requirements for systems and applied software. In this paper, the authors consider a number of concomitant complicated problems in reconfiguration, reliability, interaction, cost, speed, programming technology and related questions of design and planning. Future articles will deal with some aspects of a cross system developed by the authors for generating software for microprocessor complexes, using YeS EVM computers. Figures 4, references 6: 3 Russian, 3 Western.
[26-6610]

6610

CSO: 1863

CAPACITY ANALYSIS OF THE CENTRAL PART OF A MULTIPROCESSOR COMPUTER SYSTEM

Moscow AVTOMATIKA I TELEMEXHANIKA in Russian No 9, 1979 pp 149-157

manuscript received 14 Aug 78

VLASENKO, N. A., Moscow

[Abstract] A tentative structure of connections between the command processors (CP) and operational processors (OP) of multiprocessor computer systems (MCS) is proposed, and the capacity of the central part of MCS is investigated. That central part consists of uniform divided processors connected by a multi-bus inter-processor mainline. An algorithm for the functioning of MCS is proposed. It is shown that the proposed structure and functioning algorithm of mainline connections between CP and OP in MCS serve to increase the capacity of the central part of MCS by 10 to 35 percent depending on the number of processor-element (CP + OP) pairs in the system. The findings of theoretical analysis are in agreement with those of statistical simulation of the system. Figures 6; references: 5 Russian.
[79-1386]

AUTOMATED CONTROL SYSTEM AND NEW WORK METHODS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 11 Nov 79 p 2

[Article by R. Notman: "The ASU Teaches us how to Work in a New Way"]

[Excerpts] Academician V. Glushkov asserts that the ASU (automated control system) for a large plant is 100 times more complex than the automated system of control for a space ship or rocket.

The "Barnaul" ASU, which is now well-known in our country would not have appeared without academicians G. Marchuk, A. Aganbegyan, corresponding member V. Makarov and without I. Bobko and other Siberian scientists. But it also wouldn't have appeared without Doktorov.

A group of Siberian scientists under the leadership of Academician G. Marchuka put forward an industrial ASU with a system of adaptation capable of automatically adapting itself to the concrete conditions and requirements of production.

Thus a systematic approach to the ASU was born in agony. "Its essence," says doctor in technical sciences, Professor and Head of the department ASU of the computing center of the SO (Siberian Division) of the USSR Academy of Science Igor' Maksimovich Bobko, "lies basically in the fact that all the problems of control rely on a single data base which describes the state of the project at a given moment in time."

Now the "Camac" system of micromodelling is the most popular. It consists of a library of microprograms, more than 100,000 of them. We will not dwell in detail on how the adaptation system operates. We will merely say that it sharply facilitates the development of the ASU and instills in it principles of continuous development. Previous ASU's were rigid. If in the input information it became necessary to change some parameter, the whole ASU shook as if with fever. The situation was such that the system grew old before being incorporated.

We will generalize: first level adaptation takes the form of a program for processing data, independent of how it is represented in the machine--on magnetic tape or disks.

The second level is more concrete. Its components are modules, algorithms facilitating the construction of a particular program. This program is universal. In one enterprise all its parts will operate, in another only certain ones. But in principle it is suitable for all. In each concrete case the program is built like a house of bricks from a set of essential modules.

The third level of adaptation--this is, in essence, the possibility of extending the ASU to new projects for control. It relies on the developers of ASU's of the "highest rank" and on control personnel. Here in the foreground are simulation models, which first allow all possible variants to be tried and then a solution to be arrived at.

Strictly speaking, adaptation "grew out of" the "Barnaul" and "Sigma" ASU's.

In the experimental plant of the SO of the USSR Academy of Sciences, I asked the director Yuriy Mikhaylovich Kiselev:

"Could you name some kind of general indicator affirming the profitability of the ASU?"

"I could, but I wouldn't want to," said he.

"Why?"

"You would want to hear about rubles, but the effect expressed in rubles is often one sided, formal. There is an effect. But what does it lie in? Both in rubles and in psychological restructuring and in an essentially different attitude to the enterprise and to one's duties and in changes in the style of work and in interrelationships. The changes brought about by the ASU are not convincing when expressed in rubles.

"We are an experimental plant," Kiselev continued, "We don't have large scale mass production. Each product is treated as an individual. Previously, work pieces and components kept vanishing. There were never enough of them. We reorganized production. The ASU brought us optimized planning. Now there are no shortages. All the work pieces and components are in place, no one needs to search for them. This is a qualitative difference.

[107-9285]

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II. ECONOMIC APPLICATIONS

A. Economic Control at National Level

USSR

UDC 62-501.72:338.984

RESULTS OF COMPUTER SIMULATION OF A TWO-LEVEL SYSTEM FOR MANAGING A PLANNED ECONOMY

Moscow AVTOMATIKA I TELEMEXHANIKA in Russian No 9, 1979 pp 109-124
manuscript received 4 Sep 78

KRIVTSOV, V. YE. and TOKAREV, V. V., Moscow

[Abstract] The purpose of the computer simulation of economic management systems consists in the a priori estimation of the quality of management and in the consequent upgrading of economic mechanisms and planning schemes. The simulation procedure is described. Numerical experiments are assessed. These experiments were performed in accordance with the following program: 1) Clarification of the fundamental possibility of the long-term functioning of a closed model of a planned economic system in the automatic mode; 2) Variation of the parameters and structure of the management algorithm with the object of improving the quality of control (management) through adjustments of the control loop; 3) Testing of the constructed control system with respect to an ensemble of objects and management objectives (verification of universality of the management system); and 4) Comparison with an "ideal" management system. The resulting computerized model of the national economy, consisting of a model of the control system and a model of the controlled object, was brought close to the "ideal" system but could not be made universal since control quality deteriorated with respect to certain objectives (increase in unsold inventories, increase in surplus unspent purchasing power of the population) when managers pursued certain objectives (plan fulfillment, bonusing of workers) without regard to the effort expended. On the whole, computer simulation is a practical means of developing economic management systems in the stage preceding experiments on real economic objects. Figures 6; tables 1; references: 15 Russian.
[79-1386]

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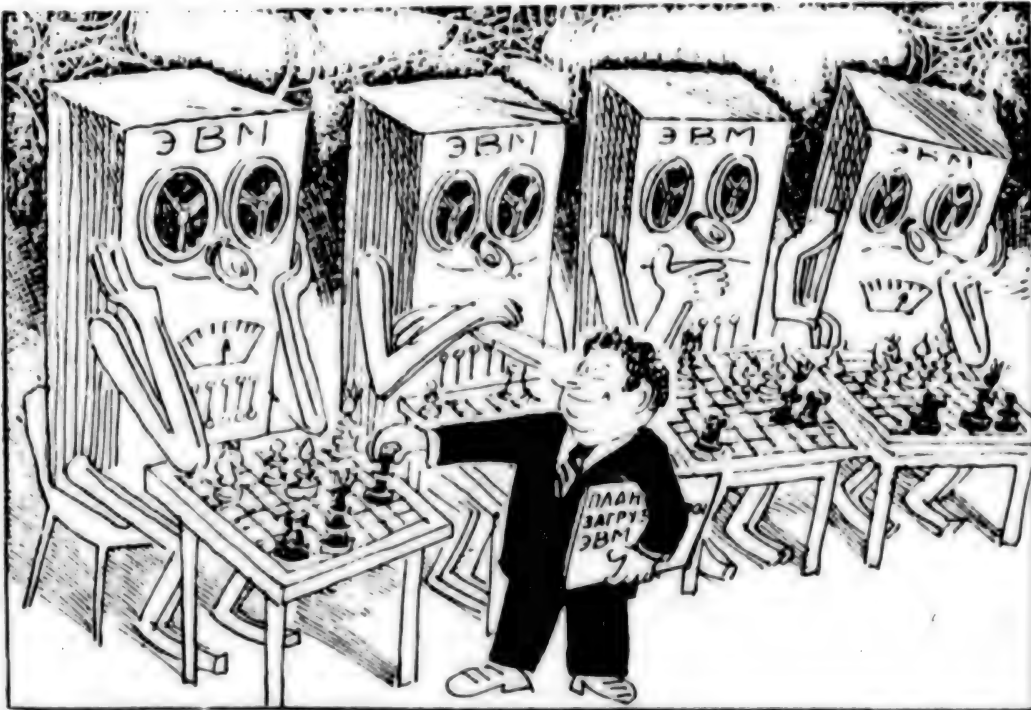
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B. Extractive Industries, Fishing

COMPUTERS NOT FULLY UTILIZED BY MINISTRY OF THE GAS INDUSTRY

Moscow PRAVDA in Russian 27 Dec 79 p 3

[Excerpts] Computers of the Ministry of the Gas Industry are ineffectively utilized. At two of its computer centers in Saratov only one-third of the computers' power is used. At the Ministry's Main Computer Center in Moscow only four of nine computers are fully utilized. In Kharkov, at the NIPIASUtransgaz [Scientific Research and Design Institute of Automated Control Systems for Gas Transportation], a computer has sat in a wet garage since 1978.



Full utilization

[140-P]

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UDC 621.311:658.514.011.56:681.3

USE OF COMPUTERS TO COMPILE SWITCHING REPORTS

Moscow ELEKTRICHESKIYE STANTSII in Russian No 10, Oct 79 pp 55-58

[Excerpts from the article by S. N. Makaroyskiy, candidate in technical sciences and S. V. Mashinskiy, engineer, Energosetproyekt [All-Union Order of the October Revolution State Planning and Surveying and Scientific-Research Institute of Power Systems and Power Supply Networks]]

[Text] One of the problems being solved by the currently developed and introduced ASU TP [automated systems for the control of technological processes] is the automatic compilation of switching reports for power association networks /1/.

The automation of the compilation and printing of the switching reports is intended to relieve power system operators of routine work, to reduce to a minimum the report preparation time, and to reduce the likelihood of errors in reports by eliminating the psychological factor. The marked acceleration of the compilation of switching reports will also make it possible to use them when there is a shortage of time among operating personnel

The procedure considered in this article for the formation of switching reports was developed at the MO (software) ASU of the "Energoset'proyekt" institute. At the same time, a package of programs has been developed for the M6000 computer in order to assure the processing of requests for switching reports in the interactive mode in the IUK [expansion unknown], their decoding, the compilation and printout of the reports, and the revision of the input data

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[114-1386]

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CSO: 1863

AUTOMATED SYSTEM FOR MONITORING DISPATCHER AND TECHNICAL CONTROL FACILITY

Moscow ELEKTRICHESKIYE STANTSII in Russian No 10, Oct 79 p 52

[Excerpt from an article by M. A. Artibilov, candidate in technical sciences, United Dispatcher Control (ODU) of the Urals]

[Text] The growth and development of modern power systems and power associations markedly complicate the problems of operative control. The large-scale use of various control facilities (communication lines, remote control, automatic regulation, safety controls) poses tighter requirements on the operating reliability of control facilities and on the reliability and accuracy of the transmitted data. In the complex of the Dispatcher and Technical Control Facility (SDTU), the association in question employs for control purposes more than 60 intersystem long-distance communication channels, 45 remote control channels, 14 sets of TM-512 remote control devices and 12 sets of UTK-1 type devices, an ARChM [Automatic regulation of frequency Modulation] system, a data transmission network, and an automatic long-range communications system. The volume of the teleinformation used by the ASDU [Automated dispatcher control system] exceeds 200 TI (telemetry) and 500 TS (telesignalization) [units] is steadily growing.

The use of remote-control and communications systems based on third-generation components and assuring the transmission of large data arrays requires that their high operating reliability along with rapid detection and elimination of malfunctions be assured.

To this end the ODU [United Dispatcher Control] of the Urals was developed and, in November 1978, introduced into operation the automated monitoring system SDTU(ASK) based on a YeS 1010 computer.

The work on that system entailed the solution of the following problems:

1) Development and introduction of facilities assuring the work of the operating and maintenance personnel (panel for engineer on duty, with a set of measuring devices and communication facilities, a switching

control panel and mnemonics, a monitoring panel for remote control devices and ARChM, and a monitoring panel for technological communication channels);

2) Construction of facilities for signaling the state of long-range automatic communications systems, remote control facilities and ARChM, switching facilities, data transmission apparatus, and a power supply system;

3) Organization of remote monitoring of the state of long-distance communication channels and remote control channels at terminal and intermediate points;

4) Development and introduction, on the basis of the YeS 1010 computer, of software for operative monitoring of the state of the SDTU, with screen display of data on breakdowns and recommendations for eliminating them, for the operator on duty;

5) Automation of the processing of operative data on the state of the SDTU, including status reports by the computer

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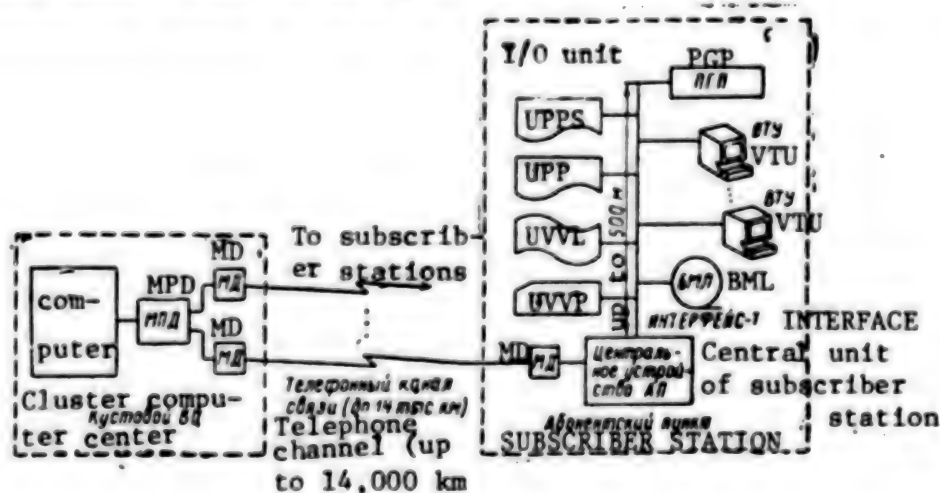
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INFORMATION-COLLECTION SYSTEM FOR RIVER TRANSPORT

Moscow RECHNOY TRANSPORT in Russian No 8, 1979 pp 21-22

[Excerpts] In a number of river basins it is planned to create partially automated systems for collection of information from ships by means of onboard radio stations. The information from ships in port will be collected by port facilities, with the data transmitted to computer centers via land-based communications lines.

It is planned to provide all subscribers of the Rechflot ASU [River Fleet Automated Control System] with communications lines and data transmission equipment. In the process, work will be done to develop a low-speed network using telegraph channels with transmission speeds of 50-200 baud and medium-speed channels using switched and nonswitched communications lines with transmission speeds of 600-4,800 baud.



Aggregated structure of subscriber-station facilities: МРД, data transmission multiplexor; МД, modem; БМЛ, magnetic tape unit; ПГП, flat plotter; UVVP, UVVL, card and paper tape I/O units; UPP, UPPS, parallel and sequential printers; VTU video terminal.
[51-8480]

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UDC 65.011.56.002.2(575.1)

COMPUTERIZED DAY-TO-DAY CONSTRUCTION MANAGEMENT IN UZBEKISTAN

Tashkent STROITEL'STVO I ARKHITEKTURA UZBEKISTANA in Russian No 8, 1979 p 13

[Article by Candidate in Economic Sciences I. Kh. Osmanov, PTO Uzstroysistema [Uzbek Construction System Production and Technical Association]: "Day-to-Day Management of Construction with Automated Information Systems (From the Experience of the UzSSR Ministry of Construction)"]

[Excerpts] The UzSSR Ministry of Construction has 31 production subdivisions. The Uzstroysistema production and technical association is the technical base; it has been called upon to use mathematical economics and computers to solve the main problems of creating and perfecting an automated system for management of construction (ASUS). The ministry is carrying out various tasks of day-to-day management, for example automation of the current information system monitoring weekly and daily planning and management, whose software was developed on a Minsk-32 computer and a YeS-1022. The aim of this task is to prepare objective information for the performance of day-to-day monitoring of the course of fulfillment of weekly and daily schedules for work by general construction and specialized construction trusts and housing construction combines in the ministry.

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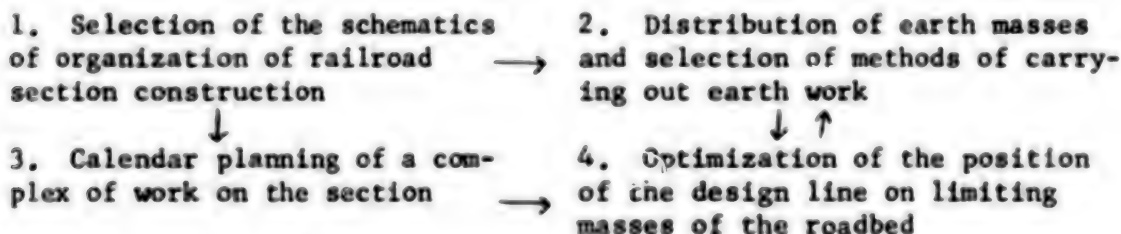
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COMPUTERIZED DESIGNING OF RAILROAD SECTIONS

Moscow TRANSPORTNOYE STROITEL'STVO in Russian No 12, 1979 p 51

[Article by A. S. Vasil'yev, engineer of the Military Academy of Rear Services and Transport (VATT)]

[Text] In the Military Academy of Rear Services and Transport, on the basis of use of methods of mathematical economics and computers a technological line for designing the organization of construction (TLPOS) of railroad sections is being developed that includes four main functional blocks:



Block 1 is intended for the selection of the schematics of organization of section construction. The algorithm provides for designation of the boundaries and directions of complex flows as points of possible expansion of construction and determination of the deadlines for the completion of work for different expansion schemes with respect to the summary productive possibilities of the allocated forces and resources. A rational scheme is selected by computer on the criterion of minimum duration of construction.

Methods of doing earth work and the distribution of masses of earth are accomplished by means of block 2.

The mathematical model of the task of distribution of earth masses in the TLPOS is a modification of a known algorithm [see TRANSPORTNOYE STROITEL'STVO, 1976, No 12, p 35] and envisages finding the optimum solution by the criterion of the minimum period required to perform the complex of work on the section within the framework of the limitations imposed by the optimum expansion scheme.

The model is realized with use of a standard simplex-method program LPS/360 for the YeS-1020 computer.

Block 3 permits accomplishing calendar planning of work, with use of the results of solution of the preceding tasks.

The algorithm envisages determination of the optimum sequence for the performance of work in case of different technological routes of sets of excavating equipment and the subsequent movement of the remaining specialized flows in accordance with the selected scheme of organization of section construction.

In the TLPOS the position of the project line on the masses of the roadbed, which determine the total period of section construction, can also be optimized (block 4). Used for that purpose is parametric analysis of LPS/360, where the parameters of the volumes of earthwork leading to corresponding refinements of the plan markers are subjected to changes.

Multivariant modelling of the organization of construction in the TLPOS will contribute to improvement of the quality of planning decisions.

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[141-2174]

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CSO: 1863

AUTOMATED CONTROL SYSTEM OF DNEPROPETROVSK TERRITORIAL ADMINISTRATION

Moscow MATERIAL'NO-TEKHNICHESKOYE SNABZHENIYE in Russian No 10, 1979
pp 60-61

/Article by V. Tubelets, deputy chief of the Dnepropetrovsk Territorial Administration, and R. Rafes, deputy director of the computer center: "On the Path of Progress"

/Text The computer center of the Ukrglavsnabsistema Production Engineering Association was set up for the more extensive use of modern methods of control on the basis of computers. The introduction of the automated control system at the Dnepropetrovsk Territorial Administration did not take place by the traditional method. At first the computer was rented. The specialists were engaged on it in the tying in of programs, the development of classifiers and the training of personnel for work under the conditions of the automated system. When a reserve was created, which was sufficient for a 12-hour average daily workload of the computer, a computer was purchased.

In the time that has passed 13 local problems with a total capacity of 1.3 million documents, which are carried out on computer, and a number of other problems with a total capacity of 8.73 million punchcards, which are executed on punchcard equipment, have been introduced and are in industrial operation. Among them are the determination of the demand, the management of stocks, the regulation of supply and marketing activity and the monitoring of deliveries, planning, accounting and the analysis of supply and marketing activity.

The conversion of the processing of documents from manual to mechanized processing (the registration of the movement of materials, settlements with customers and suppliers, the processing of income and expenditure documents) was one of the factors of the acceleration of the turnover rate of working capital. Thus, at the Dnepropetrovsk Metal Base during 1976 the turnover rate was accelerated by more than 5 days, including by 0.5 day by means of shortening the cycle of the paper flow.

The operation of the problem "The Calculation of the Balance of Supply" makes it possible to obtain in due time reliable data for overcoming the

deviations in the supply of materials to the bases of the region, to shorten the period of its processing by 60 percent and to improve the monitoring of shipments of metal to the base. Excessive and unutilized resources, which can additionally be committed to production, are being identified as a result of the solution of this problem.

The problem "The Establishment of the Plan of Deliveries to the Base" is being solved in combination with the determination of the overall specified demand. Previously the drawing up of job authorizations was carried out without coordination with the requirement of the regularity of deliveries to the base, which ensure the uniform loading of the space. When solving the problem on the computer it became evident that if the established plan was fulfilled strictly, this would make it possible to free up to 20 percent of the available warehouse space, which would give a saving of capital expenditures in the amount of 340,000 rubles. However, the implementation of the plan is encountering considerable difficulties. Soyuzglavtrubsnabsbyt and the USSR Ministry of Ferrous Metallurgy in the calculations of the workload of the mills and the calculations of the optimum current plans of production are devoting inadequate attention to deliveries to the bases. In turn the supply plants are shipping products to the bases last of all. These questions have been raised before Soyuzglavmetall, but have not been solved.

At present the Dnepropetrovsk Territorial Administration is introducing ostentatious monitoring of the deliveries of metal products to customers of the region on the basis of the comparison of the plan and the actual shipment. In order to carry out the ostentatious monitoring the payment invoices, which still arrive on nonstandardized forms, are processed on computer. In order to expand the operations on the Metal Automated Control System it is necessary to provide the Dnepropetrovsk Computer Center of the Ukrglavsnabsistema Production Engineering Association with additional developers in connection with the installation of the Unified Computer System.

A great economic impact was detected, which is achieved with the use of an automated data processing system. The determination of the overall demand was previously achieved by the requisition method under the conditions of an acute shortage of time. Upon completion of this work the staff members of the commercial division shifted to the compilation of plans of distribution (the "recorder"). On the whole about 20 books of the "recorder" are being compiled. An enormous amount of work on the compilation of the plans of distribution has to be performed manually. And in order to keep within the set period, supernumerary associates were hired to assist the division. In the course of two months 10 people performed this work, and about 80 percent of the time was spent on compiling plans of distribution. Now the period from the receipt of the documents at the computer center to the issuing of the overall demand is 7 days and 2-3 days are spent on the issuing of the "recorder." Thus, the time for compiling the orders and the plans of distribution has been reduced from 2 months to 10 days.

Prior to the introduction of the computer hardware the work on writing out the schedules of allocation and the stock notices lasted a month. In the

schedule of allocation, which was written out for one type of product, all the consignees of this product were indicated. One copy of the schedule of allocation was sent to each customer, therefore it was necessary to write out 10-15 copies of them, and up to 50 copies for products with a greater than usual demand. The division workers were not able to make the distribution of capital among the enterprises on the set date. In this connection the assistance of recruited workers was required to write out the schedules of allocation and the stock notices. When writing out the stock notices and schedules of allocation on the computer the output time was shortened from 30 to 5 days.

In 1976 the experimental introduction of the problem of distributing capital by computer with the subsequent writing out of the stock notices was carried out. The shortening of the period for delivery to enterprises of the notices about the capital will make it possible to increase the labor productivity of the accountants and to draw up in due time a balanced (according to resources) plan for each enterprise.

It is necessary to dwell on the level of preparation of the constant data. Specialized declarations of the demand, the approved forms of which arrive with elaborated product codes from the Ukrainian main administrations of supply and marketing, are used for compiling products list dictionaries. Here it is necessary to note that the main administrations often send these forms (statements) before the start of the requisition campaign. And in connection with the fact that some types of products are removed from production and, on the contrary, new ones appear, the dictionaries undergo changes. The staff members of the territorial administration are not always able to report these changes to the computer center in due time, as a result of which undesirable delays with processing the data and the overuse of computer time arise. In order to eliminate the existing shortcomings in the work with products list dictionaries it is necessary to organize the process of transmitting the changes for the dictionaries so that the administration would receive the classifiers from the main administrations no later than a month before the start of the requisition campaign.

The introduction of the problems at the level of the territorial administration is making it possible to shorten the time for the compiling of the consolidated declarations of the demand and the plans of distribution and the writing out of the stock notices and the schedules of allocation. This in turn is making it possible to shorten the time for submitting the documents to the Ukrainian main administrations of supply and marketing. Along with the shortening of the periods for performing these operations, computer processing has considerably increased their quality. [7807-123]

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G. Financial System

USSR

COMPUTERIZED ACCOUNTING IN BANKING OPERATIONS

Moscow DEN'GI I KREDIT in Russian No 9, 1979 pp 34-38

LIBERMAN, V. B., professor and SHUVAYEV, N. S., Candidate in Economic Sciences

[Abstract] While "Minsk" computers are the most widely used types in the institutions of Stroybank [All-Union Bank for Financing Capital Investments] USSR, the use of third generation computers of the unified system of electronic computers improves banking operation accounting. The functions of these computers and with various peripheral configurations within the "bookkeeping and accounting" subsystem of the "ASU-Stroybank" ["Stroybank Automated Control System"] are discussed. The specific data files for the various accounting and payment documents in the banking institutions are treated, and the packages of applied programs are broken down into the following main groups: 1) Packages which expand the capabilities of the main operating systems, which include those for the functioning of various configurations of unified system computers, but which are not included in the complement of the main operating systems; 2) Packages of general purpose applied programs which include routines for scientific calculations, the solution of standard engineering, statistical and other problems; and 3) Packages of special applied programs, which are the largest group and includes specialized production control systems, automated documentation control systems, inventory systems, and systems for automated computer planning. Though various level programming systems (i.e., machine, procedural and problem oriented) can be used, the most promising is direct access dialogue mode interaction of the user with the computer in the banking system. General examples of possible data files and their use are cited and it is anticipated that the new third generation capabilities will improve the quality of data gathering, processing and transmission, reduce the manual labor and time required for information processing, and improve the bank transaction services for clients of the USSR Stroybank.

[80-8225]

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USSR

UDC 911.2:581.526.42:51:681.3:528.9

CARTOGRAPHIC-MATHEMATICAL MODELING OF FOREST VEGETATION OF THE USSR,
AND COMPUTER MAPS OF THE STATES OF FOREST VEGETATION

IZVESTIYA AKADEMII NAUK SSSR: SERIYA GEOGRAFICHESKAYA in Russian No 5,
Sep/Oct 79 pp 97-111

SKULKIN, V. S., Institute of Geography, Far Eastern Science Center,
Academy of Sciences USSR

[Abstract] A method based on composite digital processing is proposed for modeling the forest vegetation of the USSR and producing computer-maps that represent the modeled states of various characteristics of forest vegetation. The proposed imaging technique yields a product that can be used as a tool for analyzing the spatial and temporal patterns of organization of forest vegetation in isolated regions and over the entire nation. An example is given of the results of modeling of the structure of the tree level of forest vegetation for the southern half of Primorskiy Kray. Figures 4; tables 1; references 43: 42 Russian, 1 Western.
[98-6610]

III. SOCIOCULTURAL AND PSYCHOLOGICAL PROBLEMS

A. Human Factors Engineering and Man-Machine Systems

DEVICE FOR COMPUTER RECOGNITION OF ORAL COMMANDS DEVELOPED

Moscow VOZDUSHNYY TRANSPORT in Russian 14 Oct 79 p 3

[Article: "An 'Ear' for the Computer"]

[Excerpt] A new step in the implementation of man-machine dialog has been made by specialists at the Khar'kov Institute of Radio Electronics. They have designed a device which enables the computer to comprehend the oral commands of the operator.

"Human speech undergoes several transformations in the new device," says Professor Yu. Shabanov-Kushnarenko, the project leader. "First the acoustic signal is converted into an electrical signal, which is then coded in accordance with the laws of auditory perception. The machine easily recognizes the sounds in the flow of conversational speech and reconstructs from them whole words from a rather extensive lexicon."

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B. Labor and Management

CONSTRUCTION MINISTRY PERSONNEL ACCOUNTING COMPUTERIZED

Moscow STROITEL'NAYA GAZETA in Russian 14 Oct 79 p 3

[Article: "The Computer and the Labor Force"]

[Excerpt] The Scientific Research Institute of Organization and Management of Construction under Moscow Construction Engineering Institute imeni V. V. Kuybyshev has been the first institute in the sector to develop a standard "ASU-Kadry" [Automated Personnel Management System]. This has been successfully tested in a number of large construction organizations in the country and is now being incorporated in the USSR Ministry of Construction. What does the system offer, and what is its effectiveness? Our correspondent Yu. Samoylov posed these questions to Institute director Hero of Socialist Labor I. V. Komzin.

"Studies show that the lion's share of construction organization personnel managers' time is spent in filling out all manner of forms. And frequently this work is valueless, since the actual situation changes faster than the forms can be filled out. The use of computers to keep track of movement of the labor force not only frees the managers from routine but also makes it possible to solve many problems expeditiously and correctly. The data given out by the computer can determine personnel requirements, arrange optimal placement, analyze the causes of personnel turnover and many other things. The automated subsystem subjects both the personnel managers and the leadership of discipline. The soulless computer will not decrease a bad turnover index, and accordingly the leadership will have to make an active effort to improve labor conditions and solve other problems so as to decrease turnover not on paper but in actuality. Thus a social effect is added to the economic effect."

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DEVELOPMENT OF STRUCTURES FOR GENERAL-PURPOSE COMPUTERS RELATIVE TO
PROBLEMS IN AUTOMATION OF SCIENTIFIC RESEARCH

Kiev AVTOMATIKA in Russian No 5, Sep-Oct 79 pp 63-72 manuscript
received 1 Sep 78

RABINOVICH, Z. L., Institute of Cybernetics, UkrSSR Academy of Sciences

[Abstract] The basic three general problems in automation of scientific research are: interaction between machine and research object for the purpose of data gathering, automation of inductive and deductive reasoning for data analysis, and effective user-computer interaction. The last problem is of overriding importance with regard to the development of computer structure which will most effectively aid the user. Underlying this development are such concepts as "experiment" and "artificial intelligence", with their characteristics, functions and performance also serving as the basis for the solution of the other two problems as well. Because much more progress has been made so far in terms of the first problem, data gathering, only the second problem is discussed. Automation of inductive and deductive reasoning requires semantic structures, possibly with a spatial (graphic) interpretation, realizable either with hardware or software. Attendant to the development of corresponding computer structures, typically "growing pyramidal networks", for effective use is the development of high-level languages with appropriate translators and dynamic microprogrammatic control, also extensive parallelization of the computation process on the tasks level as well as on the operations level, without exclusion of special procedures and controls. Accordingly, the development trend is toward modular multipurpose computers in standard configurations and with adequate software. An abbreviated statement of this paper was presented at the Seventh All-Union Conference on Control Problems (Minsk, 1977). Figures 3; references: 9 Russian.
[119-2415]

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IV. NATURAL SCIENCE RESEARCH

A. Conservation, Environment, and Ecology

UDC 502.55:658.5.011.56

SANGIGIYENA AUTOMATED CONTROL SYSTEM

Moscow GORODSKOYE KHOZYAYSTVO MOSKVY in Russian No 10, 1979 pp 33-34

/Article by Yu. Andryukhov/

/Text/ "Having visited one of the displays of the Exhibition of USSR National Economic Achievements," engineer P. Fedotov writes to the editorial board, "I learned that an automated control system of public health and preventive measures--the Sangigiyena Automated Control System--has been introduced in Moscow. Unfortunately the exhibition information was too brief, and I would like to become acquainted in more detail with this development, which is important to the city." At the request of the reader Yu. Andryukov, a correspondent of the journal, tells about the Sangigiyena Automated Control System.

In 1978 the Moscow Scientific Research and Design Institute of Automated Control Systems in Municipal Services (MNIPI ASU GKh) with the participation of the city sanitary and epidemiological station (MosgorSES) turned over for industrial operation an automated control system of public health and preventive measures--the Sangigiyena Automated Control System.

The main goal of the introduction of the system is the improvement of the activity of the sanitation service on the monitoring of the condition of the air at enterprises and in the city, the prevention of occupational diseases at industrial enterprises and the freeing of a large number of specialists from the manual processing of data and the compilation of various certificates and reports, which are necessary for making decisions.

The Sangigiyena Automated Control System solves three sets of problems. The first set makes it possible to determine the concentrations of toxic substances and dust in the city and at the enterprise. At the same time the nature of the technological processes, the efficiency of the ventilation, the temperature conditions and the time of the taking of samples for 73 substances are taken into account. The second set makes it possible to

control the plans of the work of the laboratories of sanitary and epidemiological stations and enterprises and to characterize their activity according to the number of analyses made during the periods under review. And, finally, by means of the third set it is possible to evaluate various methods of studying substances with allowance made for their toxic danger.

How does the Sangigiyena Automated Control System work? All the laboratories of the Moscow City Sanitary and Epidemiological Station are obliged by the 10th day of each month to submit to the sanitary and epidemiological station the detachable stubs from the sampling cards, which are filled out in conformity with specific requirements. Then by the 15th day they are sent to the computing and data processing center, where they are fed into the computer storage.

After receiving an inquiry the computer in a few minutes, depending on its complexity, lists the information. It serves as a basis for decision making. The system makes it possible to obtain on inquiry several tens of versions of the forms. The cards are signed by the laboratory worker who took the sample, the physician-hygienist, a representative of the administration and the specialist who made the analysis. And after this they become legal documents.

In response to the question of the correspondent of the journal: "What, in our opinion, are the prospects of the use of computers in environment protection?" V. I. Franchuk, chief of a division of the Moscow Scientific Research and Design Institute of Automated Control Systems in Municipal Services, said:

"The problem of the protection and rational use of the environment, like many other national economic problems, should be solved by the development of so-called problem-oriented systems, which concentrate in themselves effective means of systems analysis and computer hardware. In this case the computer should perform the most labor-consuming work--it should process the indicators which characterize the numerous factors influencing the environment and issue control recommendations to the control services. When designing the system we used the problem approach, which is specific, since for the present there are no methods materials which help to develop such automated control systems. Therefore, the gaining of experience in using such systems is of great importance."

Yu. P. Dunin, chief designer of the theme, answered the correspondent's question: "What is the peculiarity of the automated control system and what are the possibilities of using it in other cities?"

"I will begin with the fact that there are no analogs to the Sangigiyena Automated Control System in our country. Now the system has undergone the test period and is in industrial operation. During the existence of the Sangigiyena Automated Control System about 500,000 documents have been processed. The automated control system has demonstrated its enormous potentials. It has accelerated data processing several fold and has made it

possible to obtain information, which previously it was practically impossible to obtain, and what is more, with such a depth of analysis. I will cite one example. In 1977 when processing 1,472 samples for the content of phenol when producing some items it was established that 5.3 percent of the analyses had considerable excesses of the maximum permissible concentration. The obtained information made it possible to elaborate special recommendation on the reduction of the maximum permissible concentration and to send them to the enterprises. During the first half of 1978 2,000 samples were taken for this substance. The computer processing of the data showed that an excess of the norms for phenol was observed in only 2.3 percent of the cases.

"In spite of the fact that the Sangigiyena Automated Control System was developed specifically for Moscow, it can also be used without particular changes in other cities. Only some parameters become different: the number and composition of the laboratories which serve the enterprises, ministries and departments. Thus, when introduced in Kiev the financial and labor expenditures on designing were reduced several fold.

"The Sangigiyena Automated Control System can operate both on the basis of one's own computing center and on the basis of rented computers. The system is efficient when the number of documents being processed is not less than 80,000 units a year.

"In December 1978 the system was turned over to the central data bank of algorithms and programs of automated control systems (TsFAP ASU) in the form of a functional applied programs package. Now any interested organization on the basis of an agreement can have it at its disposal on agreed dates."

"The Sangigiyena Automated Control System promoted a change in the activity of the sanitary and epidemiological station on environmental protection," relates A. V. Tsessarskiy, chief of the division of labor hygiene of the Moscow City Sanitary and Epidemiological Station. "Owing to its introduction the workers of the laboratories of the city and rayon sanitary and epidemiological stations and enterprises have been freed from the processing of the results of analyses and the compiling of certificates, reports and tables. According to our data, the automated control system made it possible to release conditionally not less than 50 people for the performance of other jobs, specialists were afforded an opportunity to increase the number of samplings and to devote more time to the performance of laboratory studies and the performance of methods work. Having assumed a large amount of work, the computer ensures the thorough processing of the data. It is practically impossible to obtain such results by the traditional manual method. For example, at the Dorogomilovski Chemical Plant the samples for the content of aniline in the air during the production of dyes pointed out the exceeding of the established norms. The managers of the plant responded to our instructions that the results of the analysis were of a random nature and could not be objective. Then we linked to the solution of the problem the automated control system, which on the basis of the processing of all

the analyses and with allowance made for all the criteria let it be known that the content of aniline in the section regularly exceeded the maximum permissible content. On the basis of these data we were forced to shut down this section of the works. We hope that the managers of the plant and the USSR Ministry of the Chemical Industry after this will ensure the observance of the established sanitary norms when producing dyes.

"So that the system would operate efficiently, it was necessary to train more than 500 people in coding. Moreover, a certain psychological barrier had to be overcome. But now this is already a passed stage. Owing to the introduction of the system we have come to the conclusion about the need for the elaboration of standards on taking samples during various processes. These operations should be performed during the period of the maximum liberation of toxic substances. With allowance made for this criterion we have prepared 10 temporary methods, which are now undergoing industrial testing. In all, according to our hypotheses, about 100 such methods will be required.

"The system has undergone lengthy checking under real conditions, and now there is no longer any doubts about its effectiveness. But only the first section of the Sangigiyena Automated Control System has been introduced. And it has still not ensured the complete automation of monitoring and does not provide for the monitoring of the level of noise, vibration, electromagnetic radiation and several other parameters. We have appealed to the Main Administration of Health of the Moscow City Executive Committee and the RSFSR Ministry of Health to allocate assets for the continuation of the work. But this question so far has not been resolved. And for this reason we have been forced to halt half way. But, after all, the introduction of the entire complex of the Sangigiyena Automated Control System promises the national economy an enormous economic and ecological impact. Judge for yourself. Right now the annual economic impact from the introduction of the system is 576,000 rubles. For comparison I will note: 185,000 rubles were spent on its development.

"When introducing the Sangigiyena Automated Control System in Kiev the expenditures on its construction were reduced to almost one-fourth, while the period of assimilation was reduced to one-eighteenth. If the system is acquired through the service of the Central Data Bank of Algorithms and Programs of Automated Control Systems, the value of the expenditures on its development is reduced to one-ninetieth. It must still be borne in mind that we have calculated only the economic impact obtained from the introduction of the Sangigiyena Automated Control System. But is the ecological impact really less important?

"I should say that the first section of the system can be even more useful to people, if it is backed with everything that is necessary. An important role in providing the Sangigiyena Automated Control System with concrete data has been assigned, for example, to the sanitary laboratories of plants and enterprises. However, at present they are operating at only one-tenth

of the enterprises of the capital. And, moreover, there are different conditions of pay of the specialists, a different status and number of personnel. The time has obviously come to streamline the Statute on the Sanitary Laboratory, which was approved about 10 years ago by the AUCCTU and the USSR Ministry of Health, and to require its implementation more strictly.

"And, finally, the shortage of instruments and devices for the automatic monitoring of the content of toxic substances is complicating the work of various units of the Sangigiyena Automated Control System. Therefore, at present specialists need to spend about 70 percent of time on taking samples, performing chemical studies and doing preparatory work. The managers of the ministries and departments, which are engaged in the production of this equipment, should understand that they are also responsible for the improvement of the environment. For only by joint efforts is it possible to solve the important state problem."

Such in brief is the story of the Sangigiyena Automated Control System. It remains to be added that in 1978 the system was displayed at the Exhibition of USSR National Economic Achievements, and this year received a high rating of specialists at the international exhibition "The Equipment of the Unified System and Systems of Small Computers and Their Use."
[122-7807]

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V. INFORMATION SCIENCE

A. Information Services

SKILFUL USE OF ENGINEERING INFORMATION NEEDED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 10, 1979 pp 124-127

[Article by A. K. Aylamazyan, doctor in technological sciences, deputy Director for Scientific Work, L. M. Samoylova, head of the group for inter-sector exchange of information, All-Union Scientific Research Information Center of the USSR State Committee for Science and Technology, Yu. A. Shumov, candidate in technological sciences, Deputy Dean, Institute for Upgrading the Skills of Information Workers, of the USSR State Committee for Science and Technology, Moscow]

[Excerpt] The sharp abridgement of the "life cycle" of new technology is causing developers to look for ways to accelerate NIOKR (Scientific Research and Experimental Design Work). One of the potential means for this acceleration is skilled use of scientific-engineering information.

Scientific and technology information is correctly considered one of our national resources, like raw material and energy, which determine the social-economic development of the country. In the USSR we have formed an organizational system for management of these resources. It is represented by a single network of information services--the state system of scientific-technological information (GSNTI), whose main task is providing informational services for workers in the sectors of production, science, culture, and management organs. Since all our readers are connected with it in one way or another we will give a short description of it.

GSNTI consists of specialized all-Union, centralized sector, inter-sector territorial institutes and information centers, information departments and bureaus of organizations and enterprises. All-Union organs of scientific and technological information, for example, the well known VINITI (All-Union Institute of Scientific and Technical Information), centrally processes the flow of world wide scientific and technological information (NTI) from relevant types of documents, creates data bases and thus provides information to all the other links in the system.

The general make-up of the GSNTI includes 10 all-Union, 86 sector, 15 republic and 93 inter-sector territorial centers of scientific-technological

information. The network of informational subsections in enterprises and in organizations consists of 11.6 thousand divisions (bureaus) and 6 thousand scientific-technological libraries. We have tried to represent all this in a diagram.

In the nation a network for the training and skill upgrading of information workers has been formed; courses are given in central sector and inter-sector territorial centers of NTI; and work is done by the Institute for Upgrading the Skills of Information Workers of the USSR GKNT (State Committee for Science and Technology) (IPKIR). In six years the institute has retrained 24 thousand information workers including training them in issues related to exchange of scientific and technological documentation (NTD).

We turn now to the main theme of this paper. Within the framework of GSNTI a system operates for providing transmission of information and lending of scientific and technological developments (NTD). Information about the NTD concentrates on the results of NIOKR (Scientific Research and Experimental Design Work) (progressive technological processes, new machines, devices, materials, building constructions, methods for improving production and management, and economics and scientific organization of labor).

There is no point in going on at length about the importance and necessity for a system of exchange of scientific-technological developments. We will discuss it briefly. The system has already been in operation for several years. In this period, the practical methods for selecting, evaluating and disseminating information about NTD have taken form. A specially created service within the sector NTI's selects and evaluates information about NTD for transmission in the exchange system. For this purpose a special leaflet for inter-sector information is used. It is guaranteed that all the NTD's, information about which is contained in the information leaflets, are provided with technical documentation and that those interested will be given technical assistance in introducing them.

If the potential user requires the developer to produce technical documentation with a view to the former's needs or if it desires help from the developer in adopting the borrowed NTD, a contract is signed. A special decree of the USSR Council of Ministers regulates the work performed under such a contract.

The system operates in this way; however not all of its possibilities are realized to the fullest. Thus, the data bases of the All-Union Scientific-Technological Information Center (VNTIT), in which detailed documentation on scientific-research and applied-construction work is concentrated, is not used effectively enough in the exchange system. The data base of the VNTI Center is a unique collection of unpublished documentation in the form of microfilm reports on NIR (Scientific Research Work) and explanatory

[Key on following page]

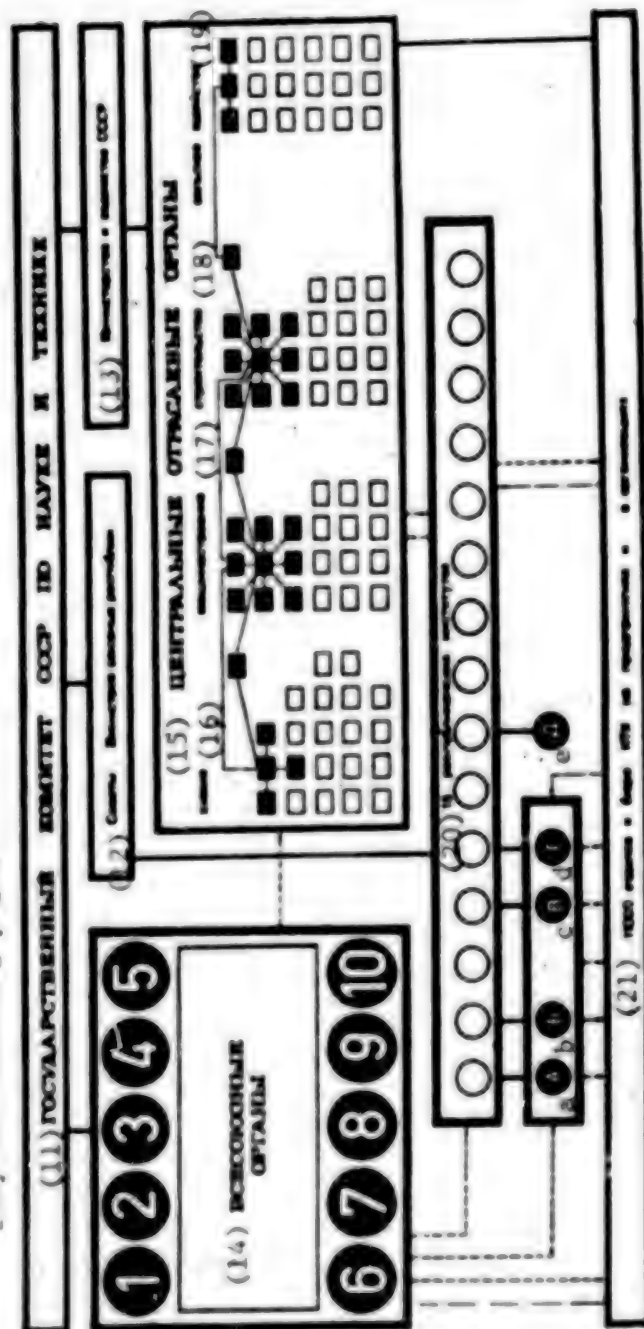


Figure. Diagram of USSR National System of Scientific-Technological Information.

Key:

- Methodological Management
- - - Descending Information Flow
- Ascending Information Flow

1. All-Union Institute of Scientific and Technological Information
2. USSR National Public Scientific-Technological Library
3. All-Union Scientific Research Institute of Patent Information and All-Union Patent-Technological Library
4. Institute of Scientific Information for the Social Sciences
5. VDNX (Exhibition of the Achievements of the National Economy) of the USSR
6. All-Union Book Chamber
7. All-Union Scientific-Technological Information Center
8. All-Union Institute of Inter-Sector Information
9. All-Union Translation Center
10. All-Union Scientific-Research Institute of Information, Classification and Coding
 - a. 65 NTI (Scientific-Technological Information) Centers
 - b. 14 NTI Centers
 - c. 3 NTI Centers
 - d. 11 NTI Centers
 - e. 1 NTI Center
11. USSR State Committee for Science and Technology
12. Council of Ministers of the Union Republics
13. USSR Ministries and Departments
14. All-Union Organs
15. Central Sector Organs
16. Chemistry
17. Engineering
18. Construction
19. Agriculture
20. 15 Republic Institutes
21. 11000 Divisions and Bureaus for NTI in Enterprises and Organizations

notes for OKR (Experimental Design Work). Users find out about new (NIOKR) Scientific Research Experimental Design Work through a signal publication "Bulletin of the Registration of NIR and OKR." The "Collection of Abstracts of NIR and OKR" includes information about completed studies and developments (or stages of them which can stand alone) and about doctoral and candidate's dissertations.

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VI. THEORETICAL FOUNDATIONS

A. General Problems

USSR

UDC 62-50:007:65

REALIZATION OF CONTROL DEVICES BASED ON LARGE STANDARD CIRCUITS. II

Kiev KIBERNETIKA in Russian No 4, Jul/Aug 79 pp 16-23 manuscript received 16 May 78

KAPITONOVA, YULIYA VLADIMIROVNA, doctor in physico-mathematical sciences, Head of a Laboratory, Institute of Cybernetics, UkrSSR Academy of Sciences, Kiev; ALEKSEYENKO, VIKTOR GRIGOR'YEVICH, leading designer, Special Design Bureau, Mathematical Machines and Systems, Institute of Cybernetics, UkrSSR Academy of Sciences, Kiev; and MISHCHENKO, ANDREY TIKHONOVICH, candidate in technical sciences, Senior Scientific Research Worker, Institute of Cybernetics, UkrSSR Academy of Sciences, Kiev

[Abstract] This is the second part of the article started in KIBERNETIKA, No 3, 1979. This part takes up the limitations placed on the microprogram and on coding of microcommands. An outline is given of a simple formal method of synthesis, and the particulars of realization of controlling devices based on standard circuits using an arbitrary degree of integration of elements. Two examples are given of synthesis of automata using the proposed technique to realize a microprogram consisting of seven microcommands. Figures 8, references 11 Russian.
[26-6610]

6610

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VII. GENERAL INFORMATION

A. Conferences

DIALOGUE-MODE COMPUTER COMPLEX CONFERENCE TOPICS HIGHLIGHTED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 5 Sep 79 p 4

[Interview with Professor Viktor Aleksandrovich Yarba, first deputy director, Institute of High-Energy Physics: "Dialogue on Dialogue"]

[Text] Yesterday in the suburban Moscow settlement of Protvino opened the second all-Union conference "Dialogue-79" (dialogue computer complexes). It is being conducted by the council on the automation of scientific research under the auspices of the presidium of the USSR Academy of Sciences, the USSR State Committee on the Utilization of Atomic Energy and the Institute of High-Energy Physics (IFVE). Taking part in the conference are specialists from more than 100 of the largest science centers and organizations in the country.

Our correspondent met with the president of the conference's organizing committee, First Deputy Director of IFVE, Professor and Doctor of Physical and Mathematical Sciences V.A. Yarba.

[Question] Viktor Aleksandrovich, by the word "dialogue" is usually understood a form of communication between a person and a person. What is the meaning of the concept of a dialogue between a person and a computer?

[Answer] Speech communication between a human and another human differs from correspondence, for example, by the rapid exchange of questions and answers. Similarly, communication between a human and a computer can also be arranged both in the form of correspondence, when the delay in receiving an answer to a question can be considerable, and in the form of a dialogue, whereby the human being in direct contact with the computer receives an answer immediately, or, as it is now customary to say, in real time.

[Question] Even if people speak in different languages, in a conversation they can understand one another. Is it true that also in the case of communication between a human and a computer the dialogue facilitates mutual comprehension?

[Answer] One hundred percent correct. Now we are becoming witnesses to the fact that computers are beginning to penetrate quite different spheres of human activity. One serious impediment hindering the wide introduction of computers and their effective utilization is the so-called barrier of the professional inaccessibility of computers. Working with modern computing systems requires a great amount of knowledge and professional training. Therefore one of the main features of dialogue systems is the presence in them of dialogue facilities for training the human being--in methods of communicating with the system itself.

[Question] In a conversation between human beings both participants are equal. But how are functions distributed in a dialogue with a computer?

[Answer] The main purpose of a computer is to strengthen certain aspects of the human intellect. Under conditions of a dialogue with a computer, the human being gains an opportunity to arrange his activity according to the principle of: for man the creative and for the computer the routine.

[Question] Why indeed has Protvino been selected as the place to hold the conference?

[Answer] The conference is being held at IFVE's base, whose main direction is research in the field of the physics of elementary particles. Nuclear physics has always occupied a leading place in the employment of computers for scientific research, where they for a long time now have become one of the main tools of the investigator.

For experiments with the Serpukhov accelerator, the largest in the country, at IFVE have already been created and successfully used entire dialogue complexes, which have made it possible to solve effectively complex problems in modern physics experimentation. Also operating in the mode of direct dialogue between a human and the computer are complexes such as the "SIGMA," "MELAS," "SOM-S1M" and others.

The conference will make it possible for us to communicate under conditions of a direct dialogue with everybody who is working in this field, and, consequently, to utilize with a minimum expenditure of time advanced knowhow and the latest achievements.

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BRIEFS

PROSPECTS OF COMPUTERS--The Second All-Union Conference on "Prospects and Problems of the Development of Computing Technology," organized by the USSR State Committee for Science and Technology and the USSR Academy of Sciences, was held in Novosibirsk in December. The participants in the conference discussed the following reports: "The state and prospects of development of computing technology," "Electronic instruments for contemporary computer hardware," "Path of development of the architecture of multiprocessor computers," "Main questions in the development and creation of high-capacity electronic computers and the element design base for them," "The state and prospects of further development of the YeS EVM [Unified System of Electronic Computers]" and "Prospects of development of the SM EVM [System of Small Computers]." [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 52, 1979 p 13] [141-2174]

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B. Organizations

COMPUTERS USED TO SOLVE NATIONAL ECONOMIC PROBLEMS

Tashkent EKONOMIKA I ZHIZN' in Russian No 7, 1979 pp 47-51

[Excerpts from the interview with V. K. Kabulov, General Director of the UznPO "Kibernetika" Uzbek Scientific-Production Association, Member Uzbek SSR Academy of Sciences, by Yu. A. Modestov, Science Column Editor of the journal EKONOMIKA I ZHIZN': "Cybernetics and Life"]

[Text] Last year, upon a decision by the republic's government, the UznPO [Uzbek Scientific-Production Association] "Kibernetika" was established. The Science Column Editor of EKONOMIKA I ZHIZN', Yu. A. Modestov held an interview with the Association's General Director, Member of the Uzbek SSR Academy of Sciences V. K. Kabulov. The text of this interview is published below.

[Question] Vasil Kabulovich, the periodical EKONOMIKA I ZHIZN' has now been for many years regularly and consistently dealing on its pages with problems of the development of economic cybernetics. Our readers have become familiar with such an abbreviation as IK s VTS AN UzSSR [Institute of Cybernetics With Computer Center, Uzbek SSR Academy of Sciences], which needs as little explaining as the abbreviations for "computer" or ASU. But now a new acronym, UznPO "Kibernetika," has appeared in the press. Surely it deserves an explanation.

[Answer] The "Kibernetika" [Cybernetics] Uzbek Scientific-Production Association was formed on the basis of the IK s VTs AN UzSSR and its special project-design bureau. The association at present consists of one scientific research institute (namely, the selfsame IK s VTs AN UzSSR), two special planning and design bureaus (ASU [Automated Control System] and RASU [Republic-wide ASU]) and a pilot plant.

Speaking very generally, the new association was established with the object of concentrating scientific research and planning and design departments as well as pilot production resources into a single so-called "fist" so as to assure development of the fundamental problems of cybernetics, of the design of automated control systems, and of the organization of the production of nonstandard equipment for this purpose. In other words, the Scientific-Production Association is a vertical grouping, from the research stage to the production stage

[Question] How did applied cybernetics develop in our republic, particularly in such a broad sphere of its application as production control?

[Answer] Taking 1971 as the point of departure, the picture is such: In that year the only ASU in Uzbekistan was being developed at the Aviation Production Association imeni V. P. Chkalov, and there were about 50 computers in this republic, chiefly belonging to scientific research institutes. At present, on the other hand, 118 ASUs of varying complexity and purpose function in the republic, along with more than 100 computer data centers and a computer pool that has grown to 328 machines

Currently the primary goal of applied research at our Association is the development and introduction of a republic-wide automated control system (RASU), along with the development of its methodological principles and methods for optimizing the plans for the socioeconomic development of Uzbekistan within the framework of a state-wide automated control system (OGAS) . . .



PHOTO: At the Computer Center of the Uzbek Scientific-Production Association "Kibernetika" the adjustments of a new third-generation computer are being completed. This computer will markedly expand the possibilities for the solution of major national-economic problems.

In the photograph: Representatives of the manufacturing plant, G. I. Lui'yev and N. A. Salo, check the performance of discrete components of the computer.

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